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Bibliographies and  
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# A SELECTIVE BIBLIOGRAPHY ON INSECTS CAUSING WOOD DEFECTS IN LIVING EASTERN HARDWOOD TREES

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# **A Selective Bibliography on Insects Causing Wood Defects in Living Eastern Hardwood Trees**

by

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Bibliographies and Literature of Agriculture No. 15  
U.S. Department of Agriculture  
Forest Service  
July 1981

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# Introduction

In forestry research insects that cause wood defects in living eastern hardwoods have been studied only sporadically. Although the problems created by wood-damaging insects have been recognized by sawmillers, forest managers, and conservationists, these insects have not received as much attention as defoliators, whose damaging effects are obvious. The secondary status of boring insects is simply a case of the injury being hidden to the eye of the casual observer. The dollar loss caused by certain wood-damaging insects equals or exceeds that caused by defoliating insects. The purpose of this bibliography is to promote more interest in fundamental research on boring insects in hardwoods.

Only insects that attack the potential merchantable portion (from stump height up) of the main stem of living eastern hardwoods qualify for inclusion in this bibliography. Insects causing internal wood defects in living eastern hardwood trees are found in the orders Coleoptera, Diptera, and Lepidoptera. Attack sites can be unblemished bark surface areas or wounds, for example, lightning scars, mechanical scars, primary wood-boring insect scars, unsound branch stubs, cankers, and basal fire cavities. The adult or immature larva bores into the inner phloem bark tissue, cambium, and/or xylem tissue, causing a permanent injury in the wood of the living standing tree. This injury later shows up in lumber or other wood products. The internal defect will appear as a stain, a bore hole, a small cavity, or any combination of these three defects.

Insect species are arranged alphabetically by family and scientific name. Common names of insects followed by an asterisk are those that have been approved by the Entomological Society of America. References are arranged in alphabetical order by author. One or more synonyms may be given for an insect. This listing is not meant to be complete, but merely an aid in a literature search. Complete listings are found in taxonomic papers cited. A list of commercially important eastern hardwood trees is provided.

For each insect species, references of original research are listed. For additional information the reader is also referred to references listed by number in the general and miscellaneous species categories. Most of these papers deal with original research; however, many are of a systematic nature, and some are extension-type papers, status reports, and textbooks. In the case of some insect species, there are few or no authored papers reporting original research. Information on these species originates with collections and surveys and is published in taxonomic papers, extension reports, and textbooks.

The initial sources of references were: Review of Applied Entomology (Series A, Agriculture), Index to the Literature of American Economic Entomology, Forestry Abstracts, Bibliography of Agriculture, and Abstracts of Entomology. References cited in publications provided additional titles. This bibliography covers all technical literature through 1978 and partially covers papers published in 1979.

# Host Tree Species

The following host species were considered when preparing the list of insects that cause defects in the wood of living eastern hardwood trees. The trees are considered commercially important for lumber, veneer, and special products by the Quality and Grade of Hardwood Timber Project of the Northeastern Forest Experiment Station, Delaware, Ohio.

## Ash (*Fraxinus*)

Black ash, *F. nigra*  
Blue ash, *F. quadrangulata*  
Green ash, *F. pennsylvanica*  
Pumpkin ash, *F. profunda*  
White ash, *F. americana*

## Aspen (See *Populus*.)

## Basswood (*Tilia*)

American basswood, *T. americana*  
Carolina basswood, *T. caroliniana*  
Florida basswood, *T. floridana*  
White basswood, *T. heterophylla*

## Beech (*Fagus*)

American beech, *F. grandifolia*

## Birch (*Betula*)

Gray birch, *B. populifolia*  
Paper birch, *B. papyrifera*  
River birch, *B. nigra*  
Sweet birch, *B. lenta*  
Water birch, *B. occidentalis*  
Yellow birch, *B. alleghaniensis*

## Buckeye (*Aesculus*)

Ohio buckeye, *A. glabra*  
Yellow buckeye, *A. octandra*

## Catalpa (*Catalpa*)

Northern catalpa, *C. speciosa*  
Southern catalpa, *C. bignonioides*

## Cherry (*Prunus*)

Black cherry, *P. serotina*  
Pin cherry, *P. pensylvanica*

## Chestnut (*Castanea*)

American chestnut, *C. dentata*

## Chinkapin (*Castanea*)

Chinakpin, *C. pumilla*

## Cottonwood (See *Populus*.)

## Dogwood (*Cornus*)

Flowering dogwood, *C. florida*

## Elm (*Ulmus*)

American elm, *U. americana*  
Cedar elm, *U. crassifolia*  
Rock elm, *U. thomasii*  
September elm, *U. serotina*  
Slippery elm, *U. rubra*  
Winged elm, *U. alata*

## Hackberry (*Celtis*)

Hackberry, *C. occidentalis*  
Sugarberry, *C. laevigata*

## Hickory and Pecan (*Carya*)

Bitternut hickory, *C. cordiformis*  
Mockernut hickory, *C. tomentosa*  
Nutmeg hickory, *C. myristicaeformis*  
Pecan hickory, *C. illinoensis*  
Pignut hickory, *C. glabra*  
Shagbark hickory, *C. ovata*  
Shellbark hickory, *C. laciniata*  
Water hickory, *C. aquatica*

## Holly (*Ilex*)

American holly, *I. opaca*

## Ironwood (*Carpinus* and *Ostrya*)

American hornbeam, *C. caroliniana*  
Eastern hophornbeam, *O. virginiana*

## Kentucky Coffeetree (*Gymnocladus*)

Kentucky coffeetree, *G. dioica*

## Locust (*Robinia* and *Gleditsia*)

Black locust, *R. pseudoacacia*  
Honeylocust, *G. triacanthos*

## Magnolia (*Magnolia*)

Bigleaf magnolia, *M. macrophylla*  
Cucumbertree, *M. acuminata*  
Southern magnolia, *M. grandiflora*  
Sweetbay, *M. virginiana*

**Maple (*Acer*)**

Black maple, *A. nigrum*  
 Boxelder, *A. negundo*  
 Red maple, *A. rubrum*  
 Silver maple, *A. saccharinum*  
 Sugar maple, *A. saccharum*

**Mulberry (*Morus*)**

Red mulberry, *M. rubra*

**Oak (*Quercus*)**

## White oak group

Bur oak, *Q. macrocarpa*  
 Chestnut oak, *Q. prinus*  
 Chinkapin oak, *Q. muehlenbergii*  
 Delta post oak, *Q. stellata* var. *mississippiensis*  
 Live oak, *Q. virginiana*  
 Overcup oak, *Q. lyrata*  
 Post oak, *Q. stellata*  
 Swamp chestnut oak, *Q. michauxii*  
 Swamp white oak, *Q. bicolor*  
 White oak, *Q. alba*

## Red oak group

Black oak, *Q. velutina*  
 Blackjack oak, *Q. marilandica*  
 Cherrybark oak, *Q. falcata* var. *pagodaefolia*  
 Laurel oak, *Q. laurifolia*  
 Northern pin oak, *Q. ellipsoidalis*  
 Northern red oak, *Q. rubra*  
 Nuttall oak, *Q. nuttallii*  
 Pin oak, *Q. palustris*  
 Scarlet oak, *Q. coccinea*  
 Shingle oak, *Q. imbricaria*  
 Shumard oak, *Q. shumardii*  
 Southern red oak, *Q. falcata*  
 Turkey oak, *Q. laevis*  
 Water oak, *Q. nigra*  
 Willow oak, *Q. phellos*

**Osage-Orange (*Maclura*)**

Osage-orange, *M. pomifera*

**Pecan (See Hickory.)****Persimmon (*Diospyros*)**

Common persimmon, *D. virginiana*

**Populus (*Aspen, cottonwood, poplar*)**

Bigtooth aspen, *Populus grandidentata*  
 Quaking aspen, *P. tremuloides*  
 Eastern cottonwood, *P. deltoides*  
 Swamp cottonwood, *P. heterophylla*  
 Balsam poplar, *P. balsamifera*

**Sassafras (*Sassafras*)**

Sassafras, *S. albidum*

**Serviceberry (*Amelanchier*)**

Serviceberry, *A. canadensis*

**Silverbell (*Halesia*)**

Carolina silverbell, *H. carolina*

**Sweetgum (*Liquidambar*)**

Sweetgum, *L. styraciflua*

**Sycamore (*Platanus*)**

Sycamore, *P. occidentalis*

**Tupelo (*Nyssa*)**

Black tupelo, *N. sylvatica*  
 Swamp tupelo, *N. biflora*  
 Water tupelo, *N. aquatica*

**Walnut (*Juglans*)**

Black walnut, *J. nigra*  
 Butternut, *J. cinerea*

**Willow (*Salix*)**

Black willow, *S. nigra*  
 Peachleaf willow, *S. amygdaloides*

**Yellow-Poplar (*Liriodendron*)**

Yellow-poplar, *L. tulipifera*

# Hardwood Borers

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# Coleoptera

## General and Miscellaneous Species

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1. Agricultural Research Service, Entomology Research Division. 1972. Control of apple tree borers. U.S. Dep. Agric. Leaflet. 274, 8 p. [*C. femorata*, *S. rugulosus*]
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3. Blatchley, W. S. 1910. On the Coleoptera known to occur in Indiana. Ind. Dep. Geol. Nat. Resour. Bull. 1, 1386 p. [General, most of spp. included]
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15. Felt, E. P., and S. W. Bromley. 1930. Shade tree insects in 1929. J. Econ. Entomol. 23(1):137-142. [*A. anxius*, *A. bilineatus*, *S. vestita*]
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17. Flint, W. P., and M. D. Farrar. 1940. Protecting shade trees from insect damage. Ill. Agric. Exp. Stn. Circ. 509, 59 p. [*A. anxius*, *C. femorata*, *C. lapathi*]

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19. Frost, C. A. 1916. Collecting notes and random observations on the Maine Coleoptera. Can. Entomol. 48:381-390. [*A. minutus*, *Agrilus politus*, *G. speciosus*, *Physocnemum brevilineum*]
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25. Hopkins, A. D. 1895. The northern timberworm of the grub species. South. Lumberman 315:7, January 15. [*A. minutus*, *M. sericeum*]
26. Hopkins, A. D. 1896. Some notes on insect enemies of trees. Can. Entomol. 28:243-250. [*A. minutus*, *A. bilineatus*, *Leptura emarginata*]
27. Hopkins, A. D. 1896. [Notes on timber worms]. Proc. Entomol. Soc. Wash. 3:82-83. [*A. minutus*, *A. bilineatus*]
28. Hopkins, A. D. 1897. Notes on some discoveries and observations of the year in W. Va.—1894-1895. W. Va. Agric. Exp. Stn. Rep. 9, p. 130-139. (Also in *Insect Life* (1894) 7:145-151.) [*A. bilineatus*, *P. brunnea*, *M. sericeum*, *C. columbianus*, *C. punctatissimus*]
29. Kirk, V. M. 1969. A list of beetles of South Carolina. Part 1—Northern Coastal Plain. S.C. Agric. Exp. Stn. Tech. Bull. 1033, 124 p. [General, many spp. included]
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33. Knull, J. N. 1934. Notes on the Coleoptera, No. 4. Entomol. News 45:207-212. [*P. cyanipes*, *Enaphalodes cortiphagus*, *O. schaumii*, *X. aceris*]
34. Loding, H. P. 1945. Catalog of the beetles of Alabama. Geol. Surv. Ala. Monogr. 11, 172 p. [General, most of spp. included]
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36. Neiswander, R. B. 1961. Borer control experiments. Arborist's News 26(4):25-30. [*A. anxius*, *C. femorata*, *M. robiniae*]
37. Pettit, R. H., and R. Hutson. 1931. Insects attacking trunk, limbs, and bark. *In* Pests of apple and pear in Michigan. Mich. Agric. Exp. Stn. Circ. Bull. 137:52-56. [*C. femorata*, *S. rugulosus*]
38. Rexrode, C. O. 1968. Tree-wounding insects as vectors of the oak wilt fungus. For. Sci. 14(2):181-189. [*A. minutus*, *A. bilineatus*, *C. femorata*, *E. rufulus*, *G. tigrinus*, *S. dasystomus*, *C. columbianus*, *X. politus*]
39. Smith, S. G. 1953. Chromosome numbers of Coleoptera. Heredity 7:31-48. [*A. anxius*, *A. liragus*, *M. robiniae*]
40. Walsh, G. E. 1913. Insect-ridden timber and the lumber defects. Wood Craft 20:36-37. [*A. minutus*, *M. robiniae*, *M. sericeum*, *C. columbianus*]
41. Wygant, Noel D. 1938. The relation of insects to shelterbelt plantations in the Great Plains. J. For. 36:1011-1018. [*C. femorata*, *P. scalator*, *T. bimaculatus*]

## Brentidae

### *Arrhenodes minutus* (Drury), Oak Timberworm\*

Synonyms: *Eupsalis minuta* Drury and *Arrhenodes minuta* (Drury)

See Coleoptera (general and misc. spp.): 5, 7, 14, 19, 25-27, 35, 38, 40.

See Hardwood Borers (general and misc. spp.): 25-28, 46-47, 68, 75, 77-78, 83, 90.

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Morris, Robert C. 1974. Log storage can affect hardwood quality. South. Lumberman 229(2837):19-20.

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## Buprestidae

### General and miscellaneous species

1. Barter, G. W., and W. J. Brown. 1949. On the identity of *Agrilus anxius* Gory and some allied species (Coleoptera: Buprestidae). Can. Entomol. 81(10):245-249. [*A. anxius*, *A. liragus*]
2. Burke, H. E. 1917. Flat-headed borers affecting forest trees in the United States. U.S. Dep. Agric. Bull. 437, 8 p. [General]
3. Burke, H. E. 1917. Notes on some western Buprestidae. J. Econ. Entomol. 10:325-332. [*A. acutipennis*, *A. anxius*, *C. femorata*, *P. cyanipes*, *Poecilonota thureura*]
4. Carlson, Robert W., and F. B. Knight. 1969. Biology, taxonomy, and evolution of four sympatric *Agrilus* beetles (Coleoptera: Buprestidae). Contrib. Am. Entomol. Inst. 4(3):105. [*A. anxius*, *A. liragus*]
5. Chittenden, F. H. 1900. Food plants and injury of North American species of *Agrilus*. U.S. Dep. Agric. Div. Entomol. Bull. 22:64-68. [*A. acutipennis*, *A. anxius*, *A. bilineatus*, *A. politus*]
6. Felt, E. P., and S. W. Bromley. 1931. Developing resistance or tolerance to insect attack. J. Econ. Entomol. 24(2):437-443. [*A. anxius*, *A. bilineatus*]
7. Fisher, W. S. 1928. A revision of the North American species of buprestid beetles belonging to the genus *Agrilus*. U.S. Natl. Mus. Bull. 145, 347 p. [*A. acutipennis*, *A. anxius*, *A. bilineatus*, *A. liragus*, *A. politus*]
8. Knull, J. N. 1925. The Buprestidae of Pennsylvania. Ohio State Univ. Stud., vol. 2, no. 2, 71 p. [General, all spp. included]
9. Mutchler, Andrew J., and H. B. Weiss. 1922. Wood-boring beetles of the genus *Agrilus* known to occur in New Jersey. N.J. Agric. Dep. Circ. 48:1-20. [*A. acutipennis*, *A. anxius*, *A. bilineatus*, *A. politus*]
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### *Agrilus acutipennis* Mannerheim

See Buprestidae (general and misc. spp.): 3, 5, 7, 9, 12.  
See Hardwood Borers (general and misc. spp.): 26, 28.

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### *Agrilus anxius* Gory, **Bronze Birch Borer\***

See Buprestidae (general and misc. spp.): 1, 3-7, 9, 11-13.  
See Coleoptera (general and misc. spp.): 4, 9, 15-18, 36, 39.  
See Hardwood Borers (general and misc. spp.): 7, 10, 32, 45, 49, 59, 73, 75-76, 89.

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- Agrilus bilineatus* (Weber), Twolined Chestnut Borer\***
- See Buprestidae (general and misc. spp.): 5-7, 9, 12.
- See Coleoptera (general and misc. spp.): 8, 10-11, 15-16, 22-23, 26-28, 38.
- See Hardwood Borers (general and misc. spp.): 10, 32-33, 38, 45, 75, 83, 86.
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*Agrilus liragus* Barter & Brown, **Bronze Poplar Borer\***

Synonym: *Agrilus granulatus* (Say)

See Buprestidae (general and misc. spp.): 1, 4, 7, 11-12.

See Coleoptera (general and misc. spp.): 39.

See Hardwood Borers (general and misc. spp.): 20, 86.

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*Agrilus politus* (Say)

See Buprestidae (general and misc. spp.): 5, 7, 9, 12.

See Coleoptera (general and misc. spp.): 19.

*Chalcophorella campestris* (Say), **Flatheaded Sycamore-Heartwood Borer**

See Buprestidae (general and misc. spp.): 12.

See Hardwood Borers (general and misc. spp.): 3-4, 19.

*Chrysobothris femorata* (Olivier), **Flatheaded Appletree Borer\***

See Buprestidae (general and misc. spp.): 3, 12-13.

See Coleoptera (general and misc. spp.): 1-2, 7, 17, 20, 22-23, 35-38, 41.

See Hardwood Borers (general and misc. spp.): 8, 10-11, 24, 33, 35, 41, 53, 73, 89.

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*Dicerca divaricata* (Say), **Flatheaded Cherry Tree Borer**

See Buprestidae (general and misc. spp.): 12.

See Coleoptera (general and misc. spp.): 22, 35.

See Hardwood Borers (general and misc. spp.): 8, 31, 86.

*Poecilonota cyanipes* Say, **Flatheaded Poplar Borer**

See Buprestidae (general and misc. spp.): 3, 12.

See Coleoptera (general and misc. spp.): 12, 33.

See Hardwood Borers (general and misc. spp.): 2, 22, 86.

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*Poecilonota thureura* (Say)

See Buprestidae (general and misc. spp.): 3.

See Hardwood Borers (general and misc. spp.): 22.

## Cerambycidae

### General and miscellaneous species

1. Beutenmuller, William. 1896. Food habits of North American Cerambycidae. J. N.Y. Entomol. Soc. 4:73-81. [*E. quadrigeminata*, *G. speciosus*, *G. pulverulentus*, *G. tigrinus*, *L. emarginata*, *M. robiniae*, *O. schaumii*, *P. brevilineum*, *P. scalator*, *S. calcarata*, *S. inornata*, *S. vestita*, *T. bimaculatus*]
2. Butovitsch, V. von. 1939. Information on mating, egg laying and feeding of Cerambycidae. Entomol. Tidskr. 60(3/4):206-258. [In Ger.] [*Neoptychodes trilineatus*, *P. brunnea*, *P. scalator*, *S. inornata*, *S. vestita*]
3. Champlain, A. B., and J. N. Knull. 1932. Fermenting baits for trapping Elateridae and Cerambycidae (Coleop.). Entomol. News 43(10):253-257. [*E. quadrigeminata*, *M. robiniae*, *Strophiona nitens*, *X. aceris*]
4. Craighead, F. C. 1923. North American cerambycid larvae: A classification and the biology of North American cerambycid larvae. Can. Dep. Agric. Entomol. Branch Bull. 27, 238 p. [All cerambycid spp. except *S. dasystemus*]
5. Dillon, Lawrence S., and E. S. Dillon. 1941. The tribe Monochamini in the Western Hemisphere. (Coleoptera: Cerambycidae). Reading Public Mus. Art Gallery, Sci. Publ. 1, 133 p., plates I-V. [*G. pulcher*, *G. pulverulentus*, *G. tigrinus*, *N. trilineatus*, *P. scalator*]
6. Duffy, E. A. J. 1953. A monograph of the immature stages of British and imported timber beetles (Cerambycidae). Br. Mus. Nat. Hist., London, Jarrold and Sons Ltd., Norwich, 350 p. [*E. quadrigeminata*, *E. rufulus*, *M. robiniae*, *N. trilineatus*, *P. brunnea*, *S. calcarata*, *T. bimaculatus*]
7. Duffy, E. A. J. 1960. A monograph of the immature stages of neotropical timber beetles (Cerambycidae). Br. Mus. Nat. Hist., London, Jarrold and Sons Ltd., Norwich, 327 p. [*E. quadrigeminata*, *N. trilineatus*, *S. dasystemus*]
8. Fattig, P. W. 1947. The Cerambycidae or long-horned beetles of Georgia. Emory Univ. Mus. Bull. 5, 48 p. [Most of cerambycid spp.]
9. Felt, E. P., and L. H. Joutel. 1904. Monograph of the genus *Saperda*. N.Y. State Mus. Bull. 74, 86 p. [All *Saperda* spp.]
10. Galford, Jimmy R. 1969. Artificial rearing of 10 species of wood-boring insects. USDA For. Serv. Res. Note NE-102, 6 p. Northeast For. Exp. Stn. [*E. rufulus*, *M. robiniae*]
11. Galford, Jimmy R. 1976. Pheromone research on cerambycids. In Research on insect borers of hardwoods: Current status, needs, and application. USDA For. Serv., Proc. Res. Coord. Meet. [Delaware, Ohio, March 30-31, 1976.] p. 27-28. [*E. rufulus*, *M. robiniae*]
12. Galford, Jimmy R. 1979. Preliminary test of booby-trapping for control of two cerambycids. USDA For. Serv., Res. Note NE-284, 3 p. Northeast. For. Exp. Stn. [*E. rufulus*, *M. robiniae*]
13. Gardiner, L. M. 1966. Egg bursters and hatching in the Cerambycidae (Coleoptera). Can. J. Zool. 44:199-212. [General]
14. Gardiner, L. M. 1970. Rearing wood-boring beetles (Cerambycidae) on artificial diet. Can. Entomol. 102(1):113-117. [*O. schaumii*, *P. brunnea*, *S. calcarata*, *S. vestita*]
15. Goldman, Edward H. 1933. Comparisons of the mouth-parts of adult longhorn beetles with reference to their food (Coleoptera: Cerambycidae). Trans. Am. Entomol. Soc. 59:85-102, plate V. [*E. quadrigeminata*, *M. robiniae*, *S. nitens*]
16. Gosling, D. C. L. 1973. An annotated list of the Cerambycidae of Michigan (Coleoptera). Part I, introduction and the subfamilies Parandrinae, Prioninae, Spondylinae, Aseminae, and Cerambycinae. Great Lakes Entomol. 6(3):65-84. [*E. quadrigeminata*, *E. cortiphagus*, *E. rufulus*, *G. speciosus*, *M. robiniae*, *P. brunnea*, *T. bimaculatus*, *Z. aceris*]
17. Gosling, D. C. L., and N. M. Gosling. 1977. An annotated list of the Cerambycidae of Michigan (Coleoptera): II. The subfamilies Lepturinae and Lamiinae. Great Lakes Entomol. 10(1):1-37. [*G. pulcher*, *G. pulverulentus*, *G. tigrinus*, *L. emarginata*, *O. schaumii*, *P. scalator*, *S. calcarata*, *S. inornata*, *S. vestita*, *S. nitens*]
18. Graham, Samuel A., and R. P. Harrison. 1954. Insect attacks and *Hypoxylon* infections in aspen. J. For. 52:741-743. [General, *S. calcarata*]
19. Grimbale, D. G. 1966. An oviposition and egg viability study of *Oberea schaumii* Lec. and *Saperda concolor* Lec. infesting trembling aspen, *Populus tremuloides* Michx. Master's thesis, Univ. Mich., Ann Arbor, 49 p.
20. Grimbale, D. G., J. C. Nord, and F. B. Knight. 1969. Oviposition characteristics and early larval mortality of *Saperda inornata* and *Oberea schaumii* in Michigan aspen. Ann. Entomol. Soc. Am. 62(2):308-315.
21. Knull, J. N. 1946. The long-horned beetles of Ohio (Coleoptera: Cerambycidae). Ohio Biol. Surv. Bull. 39, vol. 7, no. 4, p. 133-354. [All cerambycid spp. except *Acanthoderes morrisii*, *N. trilineatus*, *S. dasystemus*]
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23. Linsley, E. Gorton. 1959. Ecology of Cerambycidae. Annu. Rev. Entomol. 4:99-138. [General]
24. Linsley, E. Gorton. 1961. The Cerambycidae of North America. Part I. Introduction. Univ. Calif. Publ. Entomol. 18, 135 p. [General]
25. Linsley, E. Gorton. 1962. The Cerambycidae of North America. Part II. Taxonomy and classification of the Parandrinae, Prioninae, Spondylinae, and Aseminae. Univ. Calif. Publ. Entomol. 19, 102 p. [*P. brunnea*, *S. dasystemus*]
26. Linsley, E. Gorton. 1962. The Cerambycidae of North America. Part III. Taxonomy and classification of the subfamily Cerambycinae, tribes Opsimini through Megaderini. Univ. Calif. Publ. Entomol. 20, 188 p. [*E. quadrigeminata*, *T. bimaculatus*]

27. Linsley, E. Gorton. 1963. The Cerambycidae of North America. Part IV. Taxonomy and classification of the subfamily Cerambycinae, tribes Elaphidionini through Rhinotragini. Univ. Calif. Publ. Entomol. 21, 165 p. [*E. incertus*, *E. cortiphagus*, *E. rufulus*]
  28. Linsley, E. Gorton. 1964. The Cerambycidae of North America. Part V. Taxonomy and classification of the subfamily Cerambycinae, tribes *Callichromini* through *Ancyloacerini*. Univ. Calif. Publ. Entomol. 22, 197 p. [*G. speciosus*, *M. robinae*, *P. brevilineum*, *X. aceris*]
  29. Lügger, Otto. 1889. Insects affecting willows and poplars. Minn. Agric. Exp. Stn. Bull. 9:48-64. [*S. calcarata*, *S. inornata*]
  30. Morris, R. C. 1963. Trunk borers in cottonwood. Miss. Farm Res. 26(10):8. (Also Miss. State Univ. Agric. Exp. Stn. Inf. Sheet 826 (1963), 2 p.) [*S. calcarata*, *P. scalator*]
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  32. Mutchler, Andrew J., and H. B. Weiss. 1923. Beetles of the genera *Saperda* and *Oberea* known to occur in New Jersey. N.J. Dep. Agric. Circ. 58:3-26. [All *Saperda* and *Oberea* spp.]
  33. Myers, W. L. 1967. Distribution of oviposition slits constructed by *Oberea schaumii* LeConte and *Saperda concolor* LeConte (Coleoptera: Cerambycidae) on aspen suckers (*Populus tremuloides* Michaux). Ph.D. thesis, Univ. Mich., Ann Arbor, 88 p.
  34. Myers, W. L., F. B. Knight, and D. G. Grimble. 1968. Frequency of borer attacks as related to character of aspen sucker stands: A comparative study of *Oberea schaumii* and *Saperda inornata*. Ann. Entomol. Soc. Am. 61(6):1418-1423.
  35. Nord, J. C. 1968. The life history and behavior of *Saperda inornata* and *Oberea schaumii* (Coleoptera: Cerambycidae) in trembling aspen, *Populus tremuloides*. Ph.D. thesis, Univ. Mich., Ann Arbor, 272 p.
  36. Nord, J. C., and F. B. Knight. 1972. The distribution of *Saperda inornata* and *Oberea schaumii* (Coleoptera: Cerambycidae) within the crowns of large trembling aspen, *Populus tremuloides*. Great Lakes Entomol. 5(1):28-32.
  37. Nord, J. C., and F. B. Knight. 1972. The importance of *Saperda inornata* and *Oberea schaumii* (Coleoptera: Cerambycidae) galleries as infection courts of *Hypoxylon pruinautum* in trembling aspen, *Populus tremuloides*. Great Lakes Entomol. 5(3):87-92.
  38. Nord, J. C., and F. B. Knight. 1972. The relationship of the abundance of *Saperda inornata* and *Oberea schaumii* (Coleoptera: Cerambycidae) in large trembling aspen, *Populus tremuloides*, to site quality. Great Lakes Entomol. 5(3):93-97.
  39. Riley, C. V. 1880. Food habits of the longicorn beetles or wood borers. Am. Entomol. 3:237-239, 270-271. [General]
  40. Solomon, James D. 1976. Nature and extent of impacts caused by hardwood borers in the Southern and Southeastern United States. In Research on insect borers of hardwoods: Current status, needs, and application. USDA For. Serv., Proc. Res. Coord. Meet. [Delaware, Ohio, March 30-31, 1976.] p. 19-21. [*Oberea* spp., *P. scalator*, *S. calcarata*]
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  42. Solomon, James D., R. E. Doolittle, and T. J. Spilman. 1976. Cerambycid beetles captured in sticky-traps in Mississippi. Coleopt. Bull. 30(3):289-290. [*D. wildii*, *E. quadrigeminata*, *P. brevilineum*]
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- Acanthoderes morrisii* (Uhler)  
Synonym: *Aegomorphus morrisi* Uhler  
See Cerambycidae (general and misc. spp.): 4.  
See Coleoptera (general and misc. spp.): 3, 30, 34.
- Dorcaschema wildii* Uhler, **Mulberry Borer**  
See Cerambycidae (general and misc. spp.): 4, 21, 42.  
See Hardwood Borers (general and misc. spp.): 3-4, 79, 82, 84.
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See Cerambycidae (general and misc. spp.): 1, 3-4, 6-8, 15-16, 21, 26, 42.  
See Coleoptera (general and misc. spp.): 20.  
See Hardwood Borers (general and misc. spp.): 8, 19, 22.
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 Synonyms: *Elaphidion incertum* Newman and *Hypermallus incertus* (Casey)  
 See Cerambycidae (general and misc. spp.): 4, 8, 21, 27, 43.  
 See Coleoptera (general and misc. spp.): 13, 30.  
 See Hardwood Borers (general and misc. spp.): 8.
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- Enaphalodes cortiphagus* (Craighead), **Oak Bark Scarrer**  
 Synonym: *Romaleum cortiphagus* Craighead  
 See Cerambycidae (general and misc. spp.): 4, 16, 21, 27, 43.  
 See Coleoptera (general and misc. spp.): 33.  
 See Hardwood Borers (general and misc. spp.): 22, 78.
- Enaphalodes rufulus* (Haldeman), **Red Oak Borer\***  
 Synonym: *Romaleum rufulum* (Haldeman)  
 See Cerambycidae (general and misc. spp.): 4, 6, 8, 10-12, 16, 21, 27.  
 See Coleoptera (general and misc. spp.): 5, 38.  
 See Hardwood Borers (general and misc. spp.): 1, 25-28, 42, 54, 67-68, 78-79, 82-85, 90.
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 Synonyms: *Clytus speciosus* Say and *Plagionotus speciosus* (Say)  
 See Cerambycidae (general and misc. spp.): 1, 4, 8, 16, 21, 28.  
 See Coleoptera (general and misc. spp.): 2, 4, 6, 19.  
 See Hardwood Borers (gen. and misc. spp.): 7, 10-11, 45, 59, 75-76, 78.
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 Synonym: *Goes pulchra* Haldeman  
 See Cerambycidae (general and misc. spp.): 4-5, 8, 17, 21.  
 See Hardwood Borers (general and misc. spp.): 3-4, 22, 31, 78-79, 82, 84-85.
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*Goes pulverulentus* (Haldeman), **Beech Borer**

See Cerambycidae (general and misc. spp.): 1, 4-5, 8, 17, 21.

See Coleoptera (general and misc. spp.): 22.

See Hardwood Borers (general and misc. spp.): 25, 27-28, 34, 42, 78-79, 82, 84-85.

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*Goes tigrinus* (DeGeer), **White Oak Borer\***

See Cerambycidae (general and misc. spp.): 1, 4-5, 8, 17, 21.

See Coleoptera (general and misc. spp.): 5, 10-11, 38.

See Hardwood Borers (general and misc. spp.): 1, 3-4, 26-28, 31, 34, 54, 67-68, 78-79, 82-83.

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*Leptura emarginata* Fabricius

See Cerambycidae (general and misc. spp.): 1, 4, 8, 17, 21.

See Coleoptera (general and misc. spp.): 13, 26.

*Megacyllene robiniae* (Forster), **Locust Borer\***

Synonym: *Cyllene robiniae* Forster

See Cerambycidae (general and misc. spp.): 1, 3-4, 6, 8, 10-12, 15-16, 21, 28.

See Coleoptera (general and misc. spp.): 2, 18, 20, 35-36, 39-40.

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### *Neoptychodes trilineatus* (Linnaeus), **Three Lined Fig Tree Borer**

Synonyms: *Ptychodes trilineator* Linnaeus, *Ptychodes trilineatus* (Linnaeus), and *Ptychodes vittatus* Fabricius

See Cerambycidae (general and misc. spp.): 2, 4-7.

See Hardwood Borers (general and misc. spp.): 22.

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### *Oberea schaumii* LeConte, **Poplar Branch Borer**

See Cerambycidae (general and misc. spp.): 1, 4, 8, 14, 17, 19-21, 31-38, 40-41, 43.

See Coleoptera (general and misc. spp.): 31-33.

See Hardwood Borers (general and misc. spp.): 1, 20, 67, 82.

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See Cerambycidae (general and misc. spp.): 2, 4, 6, 8, 14, 16, 21, 25, 43.

See Coleoptera (general and misc. spp.): 22, 28.

See Hardwood Borers (general and misc. spp.): 11, 25, 28, 34, 55, 78-79.

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### *Physocnemum brevilineum* (Say), **Elm Bark Borer**

See Cerambycidae (general and misc. spp.): 1, 4, 21, 28, 42-43.

See Coleoptera (general and misc. spp.): 19.

See Hardwood Borers (general and misc. spp.): 22, 31.

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### *Plectrodera scalator* (Fabricius), **Cottonwood Borer\***

See Cerambycidae (general and misc. spp.): 1-2, 4-5, 8, 17, 21, 30-31, 40-41, 43.

See Coleoptera (general and misc. spp.): 41.

See Hardwood Borers (general and misc. spp.): 1, 33, 41, 67, 82, 86.

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- Saperda calcarata* (Say), **Poplar Borer\***
- See Cerambycidae (general and misc. spp.): 1, 4, 6, 8-9, 14, 17-18, 21, 29-32, 40, 43.
- See Coleoptera (general and misc. spp.): 35.
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- Saperda inornata* Say, **Poplar Gall Saperda**
- Synonym: *S. concolor* LeConte
- See Cerambycidae (general and misc. spp.): 1-2, 4, 9, 17, 19-21, 29, 32-38, 43.
- See Coleoptera (general and misc. spp.): 9, 12, 32, 35.
- See Hardwood Borers (general and misc. spp.): 20, 67.
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*Saperda vestita* Say, **Linden Borer\***

See Cerambycidae (general and misc. spp.): 1-2, 4, 8-9, 14, 17, 21, 32, 43.

See Coleoptera (general and misc. spp.): 15, 35.

See Hardwood Borers (general and misc. spp.): 10, 22, 31.

*Stenodontes dasystomus dasystomus* (Say), **Hardwood Stump Borer**

See Cerambycidae (general and misc. spp.): 7-8, 25.

See Coleoptera (general and misc. spp.): 38.

See Hardwood Borers (general and misc. spp.): 2, 22, 85.

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*Strophiona nitens* (Forster), **Chestnut Bark Borer**

Synonyms: *Anoplodera nitens* (Forster) and *Leptura nitens* Forster

See Cerambycidae (general and misc. spp.): 3-4, 8, 15, 17, 21.

See Coleoptera (general and misc. spp.): 13.

See Hardwood Borers (general and misc. spp.): 22.

*Tylonotus bimaculatus* Haldeman, **Ash and Privet Borer**

See Cerambycidae (general and misc. spp.): 1, 4, 6, 16, 21, 26, 43.

See Coleoptera (general and misc. spp.): 35, 41.

See Hardwood Borers (general and misc. spp.): 22, 62, 88.

*Xylotrechus aceris* Fisher, **Gallmaking Maple Borer\***

See Cerambycidae (general and misc. spp.): 3-4, 8, 16, 21, 28.

See Coleoptera (general and misc. spp.): 33.

See Hardwood Borers (general and misc. spp.): 22, 38, 59-60, 76.

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**Curculionidae**

*Conotrachelus anaglypticus* Say, **Cambium Curculio**

See Coleoptera (general and misc. spp.): 13, 29.

See Hardwood Borers (general and misc. spp.): 22.

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*Cryptorhynchus lapathi* (Linnaeus), **Poplar-and-Willow Borer\***

Synonym: *Sternochetus lapathi* (Linnaeus)

See Coleoptera (general and misc. spp.): 6, 9, 17-18, 21, 31-32.

See Hardwood Borers (general and misc. spp.): 7, 10, 36, 38, 49, 72, 75, 86.

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## Lymexylonidae

*Melittomma sericeum* (Harris), **Chestnut Timberworm\***

Synonym: *Lymexylon sericeum* Harris

See Coleoptera (general and misc. spp.): 8, 24-25, 28, 40.

See Hardwood Borers (general and misc. spp.): 22, 31, 46-47, 77-78.

## Scolytidae

### General and miscellaneous species

1. Batra, Lekh R. 1966. Ambrosia fungi: Extent of specificity to ambrosia beetles. *Science* 153:193-195. [*M. fasciatum*, *X. politus*]
2. Batra, Lekh R. 1967. Ambrosia fungi: A taxonomic revision, and nutritonal studies of some species. *Mycologia* 59:976-1017. [*C. columbianus*, *M. fasciatum*, *M. mali*, *X. dispar*, *X. germanus*, *X. politus*]
3. Batra, Lekh R., and M. Downing Michie. 1963. Pleomorphism in some ambrosia and related fungi. *Trans. Kans. Acad. Sci.* 66:470-481. [*M. fasciatum*, *X. dispar*]
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5. Bright, Donald E., Jr. 1968. Review of the Tribe Xyleborini in America North of Mexico (Coleoptera: Scolytidae). *Can. Entomol.* 100(12):1288-1323. [*X. dispar*, *X. germanus*]
6. Brooks, Fred E. 1916. Orchard barkbeetles and pinhole borers, and how to control them. U.S. Dep. Agric. Farmers' Bull. 763, 16 p. [*M. fasciatum*, *M. mali*, *P. liminaris*, *S. rugulosus*, *X. dispar*]
7. Chandler, S. C. 1939. The peach tree borers of Illinois. *Ill. Nat. Hist. Surv. Circ.* 31, 36 p. [*Phloeotribus liminaris*, *Scolytus rugulosus*]
8. Chamberlin, W. J. 1939. The bark and timber beetles of North America. *Oreg. State Coll. Coop. Assoc., Corvallis*, 513 p. [All scolytid spp.]
9. Dodge, H. R. 1938. The bark beetles of Minnesota (Coleoptera: Scolytidae). *Minn. Agric. Exp. Stn. Tech. Bull.* 132, 60 p. [*C. punctatissimus*, *D. betulae*, *M. fasciatum*, *M. mali*, *S. rugulosus*, *X. politus*]
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#### *Corthylus columbianus* Hopkins, **Colombian Timber Beetle\***

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 See Coleoptera (general and misc. spp.): 5, 10, 24, 28, 38, 40.  
 See Hardwood Borers (general and misc. spp.): 1, 17, 25-28, 30, 39-40, 47, 59, 67-69, 77-78, 83.
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- See Scolytidae (general and misc. spp.): 4, 8-9, 14.  
See Coleoptera (general and misc. spp.): 28.  
See Hardwood Borers (general and misc. spp.): 10, 31-32, 59.
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- See Scolytidae (general and misc. spp.): 4, 8-9, 22.  
See Coleoptera (general and misc. spp.): 29.  
See Hardwood Borers (general and misc. spp.): 4, 22, 31, 48.
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- Synonym: *Pterocyclon fasciatum* (Say)
- See Scolytidae (general and misc. spp.): 1-4, 6, 8-9, 12-15, 17-25.  
See Coleoptera (general and misc. spp.): 11, 14, 20, 22-23, 29-30, 35.  
See Hardwood Borers (general and misc. spp.): 4, 22.
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- Synonym: *Pterocyclon mali* (Fitch)
- See Scolytidae (general and misc. spp.): 2, 4, 6, 8-9, 12-15, 17-19, 21-23.  
See Coleoptera (general and misc. spp.): 14, 29-30, 35.  
See Hardwood Borers (general and misc. spp.): 4, 22, 31, 46.
- Phloeotribus liminaris* (Harris), **Peach Bark Beetle\***
- Synonym: *Phthorophloeus liminaris* (Harris)
- See Scolytidae (general and misc. spp.): 4, 6-8, 13, 22.  
See Hardwood Borers (general and misc. spp.): 4, 22, 31, 52.
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- Synonym: *Eccoptogaster rugulosus* Ratz.
- See Scolytidae (general and misc. spp.): 4, 6-9, 13, 16.  
See Coleoptera (general and misc. spp.): 1, 20-21, 35, 37.  
See Hardwood Borers (general and misc. spp.): 4, 10, 24, 41, 50.
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- Synonyms: *Anisandrus pyri* (Peck), *Anisandrus dispar* (Fabricius), and *Xyleborus pyri* (Peck)
- See Scolytidae (general and misc. spp.): 2-6, 8, 11, 13-14, 16, 21-22.  
See Coleoptera (general and misc. spp.): 20, 35.
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*Xylosandrus germanus* (Blandford)

Synonym: *Xyleborus germanus* (Blandford)

See Scolytidae (general and misc. spp.): 2, 5, 8, 11.

See Coleoptera (general and misc. spp.): 14.

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*Xyloterinus politus* (Say)

Synonym: *Xyloterus politus* Say

See Scolytidae (general and misc. spp.): 1-2, 4, 8-9, 14, 20-22, 24-25.

See Coleoptera (general and misc. spp.): 11, 14, 38.

See Hardwood Borers (general and misc. spp.): 31, 76.

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# Diptera

## Agromyzidae

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- Tenebrionidae**
- Strongylium tenuicolle* Say
- See Coleoptera (general and misc. spp.): 3, 29.  
See Hardwood Borers (general and misc. spp.): 4, 22, 34, 54, 78.
- Strongylium terminatum* Say
- See Coleoptera (general and misc. spp.): 3, 29.  
See Hardwood Borers (general and misc. spp.): 4, 22, 78.
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  2. Frick, Kenneth E. 1959. 5. Genus *Phytobia* Lioy. In Synopsis of the species of agromyzid leaf miners described from North America (Diptera). Proc. U.S. Natl. Mus. 108:372-377. [*P. amelanchieris*, *P. pruinosa*, *P. pruni*, *P. setosa*]
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  13. Ward, James C., and R. M. Marden. 1964. Sugar maple veneer logs should be graded for pith flecks. U.S. Dep. Agric., For. Serv. Res. Note LS-41, 4 p. [*Phytobia* sp.]

### *Phytobia amelanchieris* (Greene)

Synonym: *Agromyza amelanchieris* Greene

See Agromyzidae (general and misc. spp.): 2-4, 11.  
See Hardwood Borers (general and misc. spp.): 22.

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*Phytobia betulivora* Spencer

See Agromyzidae (general and misc. spp.): 11.

*Phytobia pruinosa* (Coquillett)

Synonym: *Agromyza pruinosa* Coquillett

See Agromyzidae (general and misc. spp.): 2-3, 6.

See Hardwood Borers (general and misc. spp.): 22, 23, 78.

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*Phytobia pruni* (Grossenbacher), **Prunus Miner**

Synonym: *Agromyza pruni* Grossenbacher

See Agromyzidae (general and misc. spp.): 2-3, 6.

See Hardwood Borers (general and misc. spp.): 22, 48, 52.

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*Phytobia setosa* (Loew), **Sugar Maple Cambium Miner**

Synonym: *Agromyza aceris* (Greene)

See Agromyzidae (general and misc. spp.): 2-4, 7, 11.

See Hardwood Borers (general and misc. spp.): 22, 59, 78.

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# Lepidoptera

## General and Miscellaneous Species

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## Cossidae

### General and miscellaneous species

1. Dix, M. E., and A. D. Tagestad. 1976. Borer research in the northern Great Plains. In Research on insect borers of hardwoods: Current status, needs, and application. USDA For. Serv., Proc. Res. Coord. Meet. [Delaware, Ohio, March 30-31, 1976.] p. 32-37. [*Acossus centerensis*, *Prionoxystus robiniae*]
2. Doolittle, Robert E., A. Tagestad, and M. E. McKnight. 1976. Trapping carpenterworms and aspen carpenterworms with sex attractants in North Dakota. Environ. Entomol. 5(2):267-269. [*A. centerensis*, *P. robiniae*]
3. Dyer, H. G. 1937. Cossidae of America. Rev. by W. Schaus. In The macrolepidoptera of the world. Vol. 6, A. Seitz, ed., p. 1263-1287. [General, all spp. included]
4. Hutchings, C. B. 1924. A study of the pupal case of *Prionoxystus macmurtrei*. 54th Entomol. Soc. Ont. Annu. Rep. (1924), p. 63-67. [*Acossus* spp., *Prionoxystus* spp., *Zeuzera* spp.]
5. Tagestad, A. D., and J. D. Stein. 1975. Response to the carpenterworms, *Prionoxystus robiniae* and *Acossus centerensis* (Lepidoptera: Cossidae) to a synthetic sex attractant in North Dakota. Proc. North Cent. Branch Entomol. Soc. Am. 30:101. (Abstr.)
6. Tietz, Harrison M. 1952. [Cossidae] In The Lepidoptera of Pennsylvania, a manual. Pa. State Univ. Agric. Exp. Stn., Sch. Agric., State College, p. 152-156. [*P. macmurtrei*, *P. robiniae*, *Z. pyrina*]

### *Acossus centerensis* (Lintner), Poplar Carpenterworm

Synonym: *Cossus centerensis* Lintner

See Cossidae (general and misc. spp.): 1-5.  
See Lepidoptera (general and misc. spp.): 1.  
See Hardwood Borers (general and misc. spp.): 3, 20, 31, 83.

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### *Acossus populi* (Walker), Aspen Carpenterworm

See Cossidae (general and misc. spp.): 2-3.  
See Hardwood Borers (general and misc. spp.): 3, 20.

### *Cossula magnifica* (Strecker), Pecan Carpenterworm\*

See Cossidae (general and misc. spp.): 2-3.  
See Hardwood Borers (general and misc. spp.): 2, 4, 22, 35, 53, 82, 89.

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See Cossidae (general and misc. spp.): 3-4, 6.  
See Lepidoptera (general and misc. spp.): 1.  
See Hardwood Borers (general and misc. spp.): 22, 25, 27-28, 42, 82-83.

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### *Prionoxystus robiniae* (Peck), Carpenterworm\*

Synonym: *Cossus robiniae* Peck

See Cossidae (general and misc. spp.): 1-6.  
See Lepidoptera (general and misc. spp.): 1.  
See Hardwood Borers (general and misc. spp.): 1, 10, 11, 20-21, 31, 33-34, 41-42, 45-47, 49, 54, 62, 67-68, 75, 77-86, 88, 90-91.

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- See Cossidae (general and misc. spp.): 3-4, 6.
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### General and miscellaneous species

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### *Euzophera ostricolorella* Hulst

See Pyralidae (general and misc. spp.): 1.

See Lepidoptera (general and misc. spp.): 1.

See Hardwood Borers (general and misc. spp.): 3, 17, 69, 83.

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### *Euzophera semifuneralis* (Walker), **American Plum Borer\***

See Pyralidae (general and misc. spp.): 1.

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## Sesiidae (= Aegeriidae)

See: Solomon, James D., and M. E. Dix.

1979. Selected bibliography of the clearwing borers (Sesiidae) of the United States and Canada. USDA For. Serv. Gen. Tech. Rep. SO-22, 18 p. South. For. Exp. Stn.

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*Paranthrene asilipennis* (Boisduval)

*Paranthrene dollii* (Neumoegen)

*Paranthrene simulans* (Grote) **Oak Clearwing Borer**

*Paranthrene tabaniformis* (Rottensburg) **Poplar Clearwing Borer**

*Podosesia aureocincta* Purrington & Nielsen **Banded Ash Clearwing\***

*Podosesia syringae* (Harris) **Lilac Borer\***

*Sesia apiformis* (Clerck) **Hornet Moth\***

*Sesia tibialis* (Harris) **Cottonwood Crown Borer**

*Synanthedon acerni* (Clemens) **Maple Callus Borer\***

*Synanthedon acerrubri* Engelhardt

*Synanthedon exitiosa* (Say) **Peachtree Borer\***

*Synanthedon geliformis* (Walker)

*Synanthedon pictipes* (Grote & Robinson) **Lesser Peachtree Borer\***

*Synanthedon rubrofascia* (Hy. Edwards)

*Synanthedon scitula* (Harris) **Dogwood Borer\***

Hay, C. John, and J. D. Solomon. 1981. A selective bibliography on insects causing wood defects in living eastern hardwood trees. U.S. Dep. Agric., Bibliogr. and Lit. of Agric. 15. 36p.

This bibliography contains 822 references selected primarily from papers dealing with some aspect of original research on wood-damaging insects that attack living eastern hardwood trees. A list of host trees that are commercially important is included.

OXFORD: 453:416.5 (048.1)

KEY WORDS: Wood borer, Coleoptera, Lepidoptera, Diptera.

